Amendments to specification of 22. May 2005. applicable to original document WO 00/21244

1. On page 1, please add the heading at the beginning of the specification:

TITLE OF THE INVENTION

2. On page 1, please replace heading:

DESCRIPTION OF THE INVENTION

with:

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3. On page 1, please insert before "1. FIELD OF THE INVENTION":

CROSS REFERENCE TO THE RELATED APPLICATIONS

P980536A, Croatia, filled 05. Oct. 1998.

PCT/HR99/00022, filled 29. Sep.1999.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not applicable

INCORPORATION BY REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC AND REFERENCE TO A MICROFICHE APPENDIX

Not applicable

4. On page 1, please replace heading:

1. FIELD OF THE INVENTION

with:

BACKGROUND OF THE INVENTION

5. On page 1, please replace heading:

2. TECHNICAL PROBLEM

with:

DESCRIPTION OF RELATED ART

6. On page 2, please delete the heading:

3. PRESENT STATE OF THE TECHNIQUE

7. On page 2, please replace the paragraph:

"The flow control solution is searched using two approaches. In the first approach, network nodes do not provide data about network state, but rather store excessive packets in memories, or discard remaining packets when memories are full. Terminals of such networks measure round trip time T, window W (the number of their own packets on the network) and packet losses, and try to adjust their packet sending rate. In the second approach, network nodes provide data about network state implicitly (e.g. enforcing waiting time or packet loss rate) or explicitly (e.g. sending forward or backward congestion indications, or even signaling the optimal sending rate for the data flow). When explicit notification is used, the data processing load in nodes can be very large, prohibiting the use of some recently proposed solutions. In all cases, except when optimal rate is explicitly signaled, packet transmitter defines new optimal rate using embedded transmitter algorithms (linear increase and exponential decrease of rate are most frequently used)."

with:

The flow control solution is searched using two approaches. In the first approach, network nodes do not provide data about network state, but rather store excessive packets in memories, or discard remaining packets when memories are full. Terminals of such networks measure round trip time T, window W (the number of their own packets on the network) and packet losses, and try to adjust their packet sending rate. In the second approach, network nodes provide data about network state implicitly (e.g. enforcing waiting time or packet loss rate) or explicitly (e.g. sending forward or backward congestion indications, or even signaling the optimal sending rate for the data flow).

When explicit notification is used, the data processing load in nodes can be very large, prohibiting the use of some recently proposed solutions. In all cases, except when optimal rate is explicitly signaled, packet transmitter defines new optimal rate using embedded transmitter algorithms (linear increase and exponential decrease of rate are most frequently used). Further systematization and references can be found in: C-Q Yang, A.V. Reddy, "**A Taxonomy for congestion Control Algorithms in packet Switching Networks**" IEEE Network, Vol. 9. No. 5. Jul. 1995.

8. On page 2, please insert before "4. THE INVENTION ESSENCE EXPOSITION ":

Regarding present state of the art, the invention solves the problem of optimal packet window and rate calculation in networks with closed loop implicit feedback flow control.

BRIEF SUMMARY OF THE INVENTION

In packet switching telecommunications networks, flow control is used to obtain optimal network working point, regulating the transmitter packet sending rate. The state of overload (congestion) or underutilization of the network can be detected explicitly using signalling from network nodes, or implicitly using number of packet (window W) and round trip time (T) measurements.

The Window-Time-Space Flow Control, WTFC is a method of determining the belonging part of network capacity, optimal packet sending rate and optimal window, based on the measured W,T point in the window-time space and knowledge about total network capacity W_0,T_0. In this way, devices with WTFC, nodes and terminals, keep optimal network working point near the on average empty queues mode of operation.

With networks utilizing WTFC, nodes can signal network parameters at connection establishment only. After that, all WTFC processing is done by terminal packet transmitter. WTFC transmitter determines both optimal window and optimal sending rate, thus improving regulation stability, limiting the number of packets in the network, and decreasing the variance of transmission rate.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

Figures 1 - 11 are used in detailed description of the invention to achieve easier invention understanding. Figures 1 and 2 present the structure of WTFC devices, and the rest of them are used to illustrate the operation of WTFC algorithms.

Figure 1. WTFC terminal structure

Figure 2. WTFC node structure

Figure 3. Queuing system with one server

Figure 4. Delay curves and optimal working point for M/M/1, G/G/1 and D/D/1 models

Figure 5. D/D/1/W model response

Figure 6. Family of delay curves depending on α

Figure 7. Optimal working point calculation

Figure 8. Constrains in W,T plane

Figure 9. Connection startup algorithm, with packet pair

Figure 10. Packet sending algorithm after first acknowledgment

Figure 11. Window calculation for a) window control and b) combined control

9. On page 2, please replace the heading:

4. THE INVENTION ESSENCE EXPOSITION

with:

DETAILED DESCRIPTION OF THE INVENTION

10. On page 19, please delete the section "5. SHORT DESCRIPTION OF FIGURES" ending with ".....b) combined control" because it has been moved in front by instruction 8.

11. On page 19, please replace the heading

6. DESCRIPTION OF INVENTION REALIZATION

with

INVENTION REALIZATION AND APPLICATION

12. On page 19, please delete the heading:

7. DESCRIPTION OF INVENTION APPLICATION